PRIVATE CLOUD

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Agenda

- Deployment Milestones
- Service Strategy
- Service Benefits
- Feature Comparison
- Future Features
- Feature Set Matrix
- Consumption Models
- Financial Summary
- Cost Comparison
- Next Steps

Deployment Milestones

- Step 1 – Create a Service Catalog and Cost Model
  - Can we offer an Infrastructure as a Service offering?
  - Can we price the offering competitively?
- Go / No Go Decision Point 1

- Step 2 – Develop Proof of Concept in Lab
- Go / No Go Decision Point 2

- Step 3 – Implement Pilot with a State Agency partner
- Go / No Go Decision Point 3

- Step 4 – Implement Private Cloud into Production

Private Cloud Service Strategy

- The goal is to transform the current CTS virtual server service into an automated service offering comparable to commercial public cloud providers.

- Functionality
  - On-demand self-service portal
  - Capability to automatically provision, de-provision, archive compute resources
  - Secure multi-tenant infrastructure with complete business unit isolation
  - Role based access control
  - Customizable templates to support specific use cases
  - Automated billing processes

Private Cloud Service Benefits

- Self-service provisioning reduces the time to deploy new servers and services
- Automated billing reduces overhead and improves the accuracy of the billing process
- New security features improve the integrity and security of virtual servers
- Multiple usage models allow customers to pool virtual resources and reduce their monthly bill
- Can integrate multiple cloud providers to allow CTS to centralize virtual hosting in both private and public cloud environments

Feature Comparison

	CTS	A Well Known Cloud-Based Service Provider
Automated Self Provisioning	X	X
Upgradable VM Resources	X	X
On-Demand Instances	X	X
Windows Licensing Included	X	X
VM Snapshots	X	X
Hypervisor Firewall Available	X	X
Resource Pooling Available	X	-
10Gb Host Networking	X	-

Feature Comparison

	CTS	A Well Known Cloud-Based Service Provider
Supports EAD Authentication for Management	X	-
Data stored on State maintained equipment	X	-
Anti-Virus/Anti-Malware Software Available	X	-
Intrusion Prevention Software Available	X	-
Automated hardware failover	X	-
Environment can evolve to comply with future OCIO Security Standards	X	-
SGN Connectivity without VPN overhead	X	-

Future Features

Infrastructure As A Service (IaaS+)

- Non-Windows Operating System (OS) Templates
- Database and Other Server Type Templates
- Anti-Virus
- Virtual Firewalls
- Application Load Balancing
- Backup
- Disaster Recovery
- Professional Services

CTS Private Cloud Feature Set Matrix

		Resource Allocation Models			Implementation Phases				
ID	**Feature**	**Pay-as-you-go**	**Reserved (Dedicated)**	**IaaS+**	**POC**	**Pilot (v1)**	**v2**	**v3**	**v4**
UC-001	Request new VM (template only)	x	x	x	x	x	x	x	x
UC-002	Request new VM (with mods to storage only)	-	x	x	-	x	x	x	x
UC-003	Request mods to storage (post-provisioning)	x	x	x	x	x	x	x	x
UC-004	Request mods to CPU (post-provisioning)	x	x	x	x	x	x	x	x
UC-005	Request mods to memory (post-provisioning)	x	x	x	x	x	x	x	x
UC-006	Auto De-provision VMs based on selected date or activity	x	x	x	-	-	x	x	x
UC-007	Notify users of provisioning status	x	x	x	-	-	x	x	x
UC-008	Notify users of threshold limits (memory, storage, etc.)	-	x	x	-	-	x	x	x
UC-009	Notify users of turn off date	x	x	x	-	-	x	x	x
UC-010	Monitor and track resource consumption and available capacity (vCOPS)	-	x	x	-	x	x	x	x
UC-011	Create custom VM templates	-	x	x	-	x	x	x	x
UC-012	Create VM on Shared VLAN	x	x	x	x	x	x	x	x
UC-013	Create VM on Customer VLAN	x	x	x	-	x	x	x	x
UC-014	Create network with NAT'd IP addresses	-	x	x	-	-	x	x	x
UC-015	Utilize hypervisor firewalls for VMs	-	-	x	-	x	x	x	x
UC-016	Utilize Anti-Malware protection for VMs	-	-	x	-	x	x	x	x
UC-017	Utilize backups for VMs	-	-	x	-	x	x	x	x
UC-018	Utilize Load Balancing for VMs	-	-	x	-	-	-	x	x
UC-019	Manage DR for VMs	-	x	x	-	-	-	x	x
UC-020	Manage external cloud resources (AWS/VMware based)	-	x	x	-	-	-	-	x
UC-021	Generate billing based on customer usage	x	x	x	-	x	x	x	x

CTS Private Cloud Consumption Models

Resource Allocation Models

Basic **Pay-as-you-go**	No resources are allocated up front. All resources are allocated per workload. This service offering lends itself to quick-start pilot projects or test and development application workloads that typically do not require persistent resource commitments or upfront resource reservations.
Dedicated	100% of resources are reservation-guaranteed. Based on the Reservation Pool allocation model. This service offering provides consumers reserved resource capacity up front, fully dedicated by individual tenant. The level of resource guarantee (always set to 100%) provides customers with a high degree of service assurance, plus additional layers of security and resource control for their application workloads.

CTS Cloud Service Consumption Models

Basic - Pay-as-you-go

	vCPU	Memory (GB)	Storage (GB)
Extra Small VM	1	4	100
Small VM	2	4	100
Medium VM	2	8	100
Large VM	4	16	100

Reserved (dedicated)

	Extra Small	Small	Medium	Large
CPU Reserved	10 GHz	25 GHz	50 GHz	100 GHz
Memory Reserved	20 GB	50 GB	100 GB	200 GB
Storage (base)	1TB	1.25 TB	2.5 TB	5 TB
VM Limit (Can be changed)	25	60	125	250
Approx VMs (Not limit)	10-20 VMs	25-50	50-100	200+

Financial Summary

RATE CARD		New VM Rate	Dedicated VDC Rate
VM Size	**Storage Type**		
Extra Small	*High Performance*	$ 157	$ 967
Small	*High Performance*	$ 181	$ 1,939
Medium	*High Performance*	$ 215	$ 3,878
Large	*High Performance*	$ 332	$ 7,756

Note: The new VM rates represent an average 30% reduction over current CTS VM rates

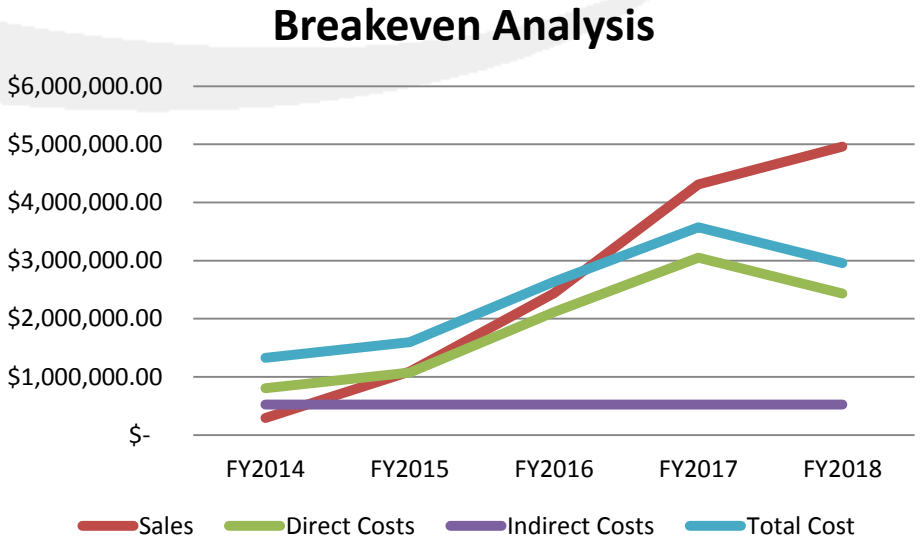
Financial Summary (cont'd)

Service Adoption Projections

Resource Type	% Distribution	Number of VMs Year 1	Year 2	Year 3	Year 4	Year 5
Per VM	40%	120	320	720	1,200	1,200
Reserved VDC Pool	60%	180	480	1,080	1,800	1,800
Total Capacity	**100%**	**300**	**800**	**1,800**	**3,000**	**3,000**

Financial Summary (cont'd)

Based on Actual Rates						
FY	**Sales**	**Direct Costs**	**Indirect Costs**	**Total Cost**	**Diffference**	**Cumul Breakeven**
FY2014	$294,042.31	$802,190.57	$522,912.47	$1,325,103.04	($1,031,060.73)	($1,031,060.73)
FY2015	$1,092,258.40	$1,073,562.02	$522,912.47	$1,596,474.49	($504,216.09)	($1,535,276.82)
FY2016	$2,440,437.56	$2,113,556.76	$522,912.47	$2,636,469.23	($196,031.68)	($1,731,308.50)
FY2017	$4,310,458.03	$3,049,227.13	$522,912.47	$3,572,139.60	$738,318.43	($992,990.07)
FY2018	$4,959,866.04	$2,433,346.63	$522,912.47	$2,956,259.10	$2,003,606.94	$1,010,616.87



Cost Comparison

Item	CTS	A Well Known Cloud-Based Service Provider
Virtual Servers	$ 14,304.00	$ 21,461.76
Storage	$ 4,329.60	$ 1,279.20
Data Transfer	$ -	$ 3,720.00
SGN Connectivity	$ -	$ 561.60
Security Software	$ -	$ 1,000.00
Total Yearly Cost	$ 18,633.60	$ 28,022.56

Sample SharePoint Environment	CTS	A Well Known Cloud-Based Service Provider
(2) Web Front Ends [2 CPU, 8GB RAM]	(2) Medium Instances	(2) m1.large
(2) Application Servers [2 CPU, 8GB RAM]	(2) Medium Instances	(2) m1.large
(1) Database Server [4 CPU, 16GB RAM]	(1) Large Instance	(1) m1.xlarge
820GB Total Storage	820GB Silver Tier Storage	820GB EBS Storage
2TB Monthly Data Transfer OUT	Unlimited	2TB Data Transfer OUT
SGN Connectivity	Included	VPC VPN (720 hr)
AV/IPS/Firewall Software	Included	Customer Provided

Next Steps

1. November – December 2013

   Deploy Virtual Cloud Automation Center (vCAC) 6.0 beta in test. Work with interested agencies to demo and receive feedback on usability.

2. January – March 2014

   Partner with a customer to define and complete a Production Pilot once vCAC 6.0 is in General Availability (GA).

3. April – May 2014

   Move to full production phase based on results of pilot.